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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/799,705	03/15/2004	Dongzhi Chi	4249-0113P	8968

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EXAMINER

TRAN, THANH Y

ART UNIT	PAPER NUMBER
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2822

DATE MAILED: 10/10/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/799,705

Applicant(s)

CHI ET AL.

Examiner

Thanh Y. Tran

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 January 2006.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 12-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2 and 4-11 is/are rejected.
- 7) ☒ Claim(s) 3 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|----------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>7/29/04 & 3/24/06</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Applicant's election of Group I, Species I (claims 1-11) in the reply filed on 1/17/06 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-2, 4-5, 8, and 10-11 are rejected under 35 U.S.C. 102(e) as being anticipated by Ku et al (U.S. 2004/0209432).

As to claim 1, Ku et al discloses a method of fabricating a nickel silicide layer, which comprises: providing a substrate comprising silicon ("silicon and/or polysilicon") (see paragraph [0015]) which optionally comprises silicon oxide ("desired silicide") (see paragraph [0015]); depositing a layer of at least a 3-component metal alloy comprising nickel on a surface of the substrate ("nickel/tantalum alloys") (see paragraph [0010]); and annealing the alloy and the substrate to form the nickel silicide layer ("nickel silicide") (see paragraphs [0010, and [0012]].

As to claim 2, Ku et al discloses a method of fabricating a nickel silicide layer, wherein the alloy further comprises: a) at least one metal selected from the group consisting of titanium,

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zirconium and hafnium (see paragraph [0016]); and b) at least one metal selected from the group consisting of platinum and palladium (see paragraph [0016]).

As to claim 4, Ku et al discloses a method of fabricating a nickel silicide layer, wherein there is no substantial film agglomeration and NiS.sub.2 formation (see paragraph [0009]).

As to claim 5, Ku et al discloses a method of fabricating a nickel silicide layer, wherein the substrate comprising silicon includes gate, source and drain regions and contact regions (see paragraphs [0036]-[0037]).

As to claim 8, Ku et al discloses a method of fabricating a nickel silicide layer, wherein any excess metal alloy, which has not reacted with at least one surface of the substrate, is removed from the semiconductor structure ("remainder" which is not reacted is removed, see paragraph [0008]).

As to claim 10, Ku et al discloses a method of fabricating a nickel silicide layer, wherein the annealing is performed in a vacuum, in nitrogen gas ("N.sub.2 gas") or in another inert gas ("inert gases") (see paragraph [0042]).

As to claim 11, Ku et al discloses a method of fabricating a nickel silicide layer, wherein the substrate is selected from Si_{1-x}Ge_x, wherein $x < 1$ (see paragraph [0015], when $x=0$, Si_{1-x}Ge_x = Si, and paragraph [0015] discloses that the substrate comprising of Si).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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4. Claims 6-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ku et al (U.S. 2004/0209432).

As to claims 6 and 7, Ku et al does not disclose the 3-component metal alloy is sputter deposited to a thickness of up to 500 Angstroms; and wherein the annealing is performed at a temperature of up to 800.degree. C. However, providing a thickness of up to 500 Angstroms for a metal alloy, and a temperature of up to 800.degree. C for annealing a alloy metal would have been obvious to an ordinary artisan practicing the invention because, absent evidence of disclosure of criticality for the range giving unexpected results, it is not inventive to discover optimal or workable ranges by routine experimentation. In re Aller, 220 F.2d 454, 105 USPQ 233, 235 (CCPA 1955). Furthermore, the specification contains no disclosure of either the critical nature of the claimed dimensions of any unexpected results arising therefrom. Where patentability is aid to be based upon particular chosen dimensions or upon another variable recited in a claim, the Applicant must show that the chosen dimensions are critical. See In re Woodruff, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

5. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ku et al (U.S. 2004/0209432) in view of Shah et al (U.S. 6,509,094).

Ku et al does not disclose the alloy consists of $\text{Ni}_{1-x-y}\text{Ti}_x\text{Pt}_y$, wherein $0.25 \geq x \geq 0.02$ and $0.25 \geq y \geq 0.02$.

Chi et al discloses in claims 7 and 9 an alloy consists of $\text{Ni}_{1-x-y}\text{Ti}_x\text{Pt}_y$, ("NiTiPt") material (when $x = 1$, $y = 1$, $\text{Ni}_{1-x-y}\text{Ti}_x\text{Pt}_y = \text{NiTiPt}$). Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify the method of Ku et

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al by using an alloy consists of NiTiPt material as taught by Shah et al for improving the thermal stability.

Allowable Subject Matter

6. Claim 3 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.


Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thanh Y. Tran whose telephone number is (571) 272-2110. The examiner can normally be reached on M-F (9-6:30pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Zandra Smith, can be reached on 571-272-2429. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TYT


Zandra V. Smith
Supervisory Patent Examiner
2 Oct. 2006